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- A method for determining a position of an acoustic receiver, comprising:
 determining a plurality of acoustic ranges from at least a first signal source position and a
 second signal source position, respectively, to the acoustic receiver;
 ascertaining a non-acoustic constraint on the acoustic receiver's position; and
 determining the acoustic receiver's position from the first and second acoustic ranges and the
 non-acoustic constraint.
- 2. The method of claim 1, wherein ascertaining the non-acoustic constraint includes one of sensing an angular orientation of the acoustic receiver, sensing a heading of the acoustic receiver, sensing a water depth of the acoustic receiver's position, retrieving an archived water depth measurement for the acoustic receiver's position, and retrieving a stored distance from a known second position to the acoustic receiver's position.
- 3. The method of any preceding claim 1 to claim 2, wherein determining the acoustic receiver's position from the acoustic ranges and the non-acoustic constraint includes: determining an intersection of a first sphere defined by the first signal source position, a second sphere defined by the second signal source position, and a plane defined by the non-acoustic constraint; and selecting one point of the intersection.
- 4. The method of claim 3, wherein selecting the one point of the intersection includes one of determining the intersection of a third sphere defined by a third signal source position, determining a water depth at the acoustic receiver's position, and eliminating a second point of intersection as physically improbable.
- 5. The method of any preceding claim 1 to claim 2, wherein determining the position from the acoustic ranges and the non-acoustic constraint includes:
 - modeling the acoustic receiver's position from historical positions associated with the acoustic receiver's position; and
 - applying an inversion algorithm to constrain the modeled position with the nonacoustic constraint.

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- 6. The method of claim 5, wherein applying the inversion algorithm includes applying a linear regression or a least squares fit.
- 7. The method of claim 5, wherein the acoustic receiver's position is determined dynamically as the position changes over time through the historical positions.
- 8. The method of any preceding claim 1 to 6, wherein the acoustic receiver's position is determined dynamically as the position changes over time.
- 9. The method of any preceding claim 1 to 8, further comprising performing the method for a plurality of points.
 - 10. The method of claim 9, wherein the points are constrained to points on a cable.
- 11. The method of claim 10, further comprising determining the shape of the cable from the determined positions.
- 12. The method of claim 1, further comprising determining an acoustic range from a third signal source position.
 - 13. An apparatus, comprising:

at least one acoustic source;

an acoustic receiver capable of receiving a plurality of acoustic signals transmitted by the at least one acoustic source from at least two signal source positions; and a computing system programmed to determine a position of the acoustic receiver from the acoustic ranges between the at least two signal source positions and the acoustic receiver and a non-acoustic constraint.

- 14. The apparatus of claim 13, wherein the at least one acoustic source comprises an airgun.
- 15. The apparatus of claim 13, further comprising a sensor located at the position of the acoustic receiver to sense the non-acoustic constraint.
- 16. The apparatus of claim 15, wherein the sensor is one of an angular orientation sensing device, a heading sensor, and a water depth sensor.

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- 17. The apparatus of claim 15, wherein the sensor comprises one of means for sensing an angular orientation of the position, means for sensing a heading for the position, and means for sensing a water depth.
- 18. The apparatus of claim 13, wherein the computing system is further programmed to analytically determine the position.
- 19. The apparatus of claim 18, wherein the computing system is further programmed to, for the acoustic receiver's position:

determine the intersection of a first sphere, a second sphere, and a plane, the first sphere and the second sphere being defined by the acoustic ranges and the plane being defined by the non-acoustic constraint; and

select one point of the intersection.

- 20. The apparatus of claim 19, wherein the computing system is further programmed to impose the non-acoustic constraint in selecting the one point of the intersection.
- 21. The apparatus of claim 20, wherein the non-acoustic constraint is one of an angular orientation of the acoustic receiver, a third acoustic range from a third signal source to the acoustic receiver, a water depth measurement for the acoustic receiver's position, and a heading for the acoustic receiver.
- 22. The apparatus of claim 18, wherein the computing system is further programmed to analytically determine the acoustic receiver's position dynamically as the position changes over time.
- 23. The apparatus of claim 13, wherein the computing system is further programmed to, for the acoustic receiver's position:

model the acoustic receiver's position from historical positions associated with the position; and

apply an inversion algorithm to constrain the modeled position with the non-acoustic constraint.

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- 24. The apparatus of claim 23, wherein the computing system is further programmed to apply at least one of a linear regression and a least squares fit in applying the inversion algorithm.
- 25. The apparatus of claim 23, wherein the acoustic receiver's position is determined as the position changes over time through the historical positions.
- 26. The apparatus of claim 13, wherein the non-acoustic constraint is one of a third acoustic range from a third signal source position to the acoustic receiver, a water depth measurement for the acoustic receiver's position, an angular orientation of the acoustic receiver, and a heading for the acoustic receiver.
- 27. The apparatus of claim 13, further comprising a cable on which the acoustic receiver is deployed.